

**DISCUSSION OF THE AMENDMENTS**

Claim 1 is currently amended.

Claim 2 is original.

Claims 3-11 were previously presented.

Upon entry of the amendment claims 1-11 will be active.

The amendment to claim 1 is supported on page 8, lines 21 and 22, page 5, line 29 to page 6, line 1 and page 10 lines 9-14 of the specification.

No new matter has been added.

### REMARKS

The Office rejected claims 1, 3, 10 and 11 under 35 U.S.C. §102(b) over FR (FR 2748021-A1). In addition, the Office rejected claims 1-11 under 35 U.S.C. §103(a) over the combination of Le Peltier (U.S. Patent No. 6,187,985) and FR.

The present disclosure involves an isothermal process for dehydrogenating alkanes to alkenes. The process utilizes a dehydrogenation-active catalyst containing one or more elements of transition group VIII and the process runs at a temperature from 400-700°C. The process also introduces heat from the outside into the reacting gas mixture by heating the reactor externally. In addition, the catalyst bed contains a catalytically inactive, inert diluent material. Applicants submit that cited references do not teach or suggest all the recitations of the claimed method and there would be no motivation to combine references as the Office has suggested.

The rejection of claims 1, 3, 10 and 11 under 35 U.S.C. §102(b) over FR is traversed.

FR describes a process for dehydrogenating alkanes to alkenes utilizing a CrO<sub>3</sub>-based catalyst. The process described in FR operates at a temperature from 200-450°C, preferable from 250-400°C (page 5, lines 23 and 24). Applicants note that Cr is not a transition group VIII element as recited in the claimed process. Therefore, the cited reference does not teach or suggest all the recitations of the claimed process, and accordingly, the claim process would not have been anticipated or obvious over FR. As such, Applicants respectfully request that the Office withdraw the rejection of claims 1, 3, 10 and 11 under 35 U.S.C. §102(b) over FR.

The rejection of claims 1-11 under 35 U.S.C. §103(a) over Le Peltier and FR is respectfully traversed.

Le Peltier describes a process for dehydrogenating saturated aliphatic hydrocarbons to olefinic hydrocarbons. The process utilizes a metal from group VIII and carries out the process at a temperature in the range of 400°C to 800°C depending on the nature of the feed. Le Peltier describes utilizing an isothermal tube reactor to carry out the reaction. As the Office notes, Le Peltier does not teach or suggest the use of a catalytically inactive, inert diluent material.

Applicants also note that Le Peltier does not teach or suggest where heat is introduced from outside into the reacting gas mixture by heating the reactor externally.

The Office relies on FR for use of an inert catalyst diluent. Applicants submit that there would have been no motivation to combine Le Peltier with FR at the time the invention was made.

As noted above, FR utilizes a chromium catalyst and runs at a much lower temperature (examples use 260-350°C) than that for the group VIII catalyst system of the claimed process and the process described in Le Peltier. (Examples in Le Peltier use 450-470°C).

Le Peltier does not teach or suggest the presence of “hot-spots” nor does Le Peltier describe the desirability of controlling hot-spots in the reactor. Applicants submit there would be no motivation to make the suggested modification based on the teachings of Le Peltier. FR utilizes a catalyst system that requires a much lower operating temperature relative to the group VIII metals. FR describes avoiding hot-spots with a chromium catalyst but not a group VIII catalyst. Neither references teach or suggest the need to avoid hot-spots with the group VIII catalysts. Because FR and Le Peltier use different catalyst systems with different operating requirements, there would be no motivation to combine or modify Le Peltier as suggested by the Office. In other words, the Office is concluding that what is required for a chromium catalyst is necessarily required for a group VIII catalyst. There is nothing on the record to suggest this type of conclusion.

Applicants also note that the references do not teach or suggest a process utilizing a group VIII metal catalyst where heat is introduced from outside into the reacting gas mixture by heating the reactor externally. Le Peltier describes using an isothermal tube reactor; however, Le Peltier does not disclose how the temperature is controlled. As noted above, FR does not utilize a group VIII metal catalyst. As Applicants have noted on page 1 (lines 10-15) of the specification, the dehydrogenation reaction is highly exothermic, and therefore, the reaction is capable of maintaining the reactor temperature internally. Accordingly, Le Peltier does not necessarily run the process where the reactor is heated externally. Therefore, the claimed

process would not have been obvious over the combination of cited references. Because there is no motivation to combine the cited references and because the cited references do not teach or suggest all the recitations of the claimed method, Applicants respectfully request that the Office withdraw the rejection.

In view of the above remarks, Applicants believes the pending application is in condition for allowance. Favorable reconsideration is respectfully requested.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 03-2775, under Order No. 13156-00005-US from which the undersigned is authorized to draw.

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Respectfully submitted,  
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